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EMRS: PROTOTYPING A MULTIPURPOSE ROVER FOR THE FUTURE LUNAR EUROPEAN MISSIONS

Abstract

Forefront technology for Mars and Moon exploration is currently designing, prototyping and testing mobility systems based on modular approach, designed for extreme temperatures, with high levels of autonomy and as much as possible versatile and capable of payload transport up to some few hundreds of kgs. ESA's program "European Moon Rover System (EMRS)" is TAS –I first iteration of a European mobile robotic platform expected to operate on the Moon surface by 2030, in the environment of ARGONAUTS. The goal of this mobility platform is to provide a common locomotion element able to host and service a variety of payloads across different mission scenarios, from exploration of polar regions, to surface assets manipulation and regolith excavation, and can be adapted to many others. TAS –I, as prime contractor of pre-phase A – completed a preliminary cycle of conceptual design and full-scale functional prototyping, up to demonstration and testing on the field. The presence of a functional prototype, so early in terms of program phases, is deemed as a positive evolution of model philosophy approach in the public European space sector, opening the door for early de-risking activities and fostering hands on activities of European technicians and engineers in the sector of space robotics. The following paper exhibits the main findings of the activity, while highlighting the technological challenges of the prototyping and future opportunities for the program